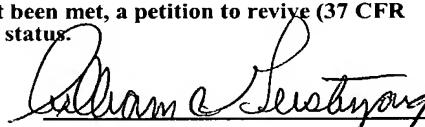


FORM PTO-1390 (Modified) (REV 11-2000)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER <b>Metal 1285-WCG</b>
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371				U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR <b>10/030196</b>
INTERNATIONAL APPLICATION NO <b>PCT/EP00/05846</b>	INTERNATIONAL FILING DATE <b>24 June 2000 (24.06.00)</b>	PRIORITY DATE CLAIMED <b>7 July 1999 (07.07.99)</b>		
TITLE OF INVENTION <b>TRACK SUPPORT</b>				
APPLICANT(S) FOR DO/EO/US <b>Rolf HEDDRICH, Hartmut HOYER and Wolfgang OERTEL</b>				
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:				
<ol style="list-style-type: none"> <li>1. <input checked="" type="checkbox"/> This is a <b>FIRST</b> submission of items concerning a filing under 35 U.S.C. 371.</li> <li>2. <input type="checkbox"/> This is a <b>SECOND</b> or <b>SUBSEQUENT</b> submission of items concerning a filing under 35 U.S.C. 371.</li> <li>3. <input checked="" type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (24) indicated below.</li> <li>4. <input checked="" type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (Article 31).</li> <li>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371 (c) (2))             <ol style="list-style-type: none"> <li>a. <input type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau).</li> <li>b. <input checked="" type="checkbox"/> has been communicated by the International Bureau.</li> <li>c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</li> </ol> </li> <li>6. <input checked="" type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2))             <ol style="list-style-type: none"> <li>a. <input checked="" type="checkbox"/> is attached hereto.</li> <li>b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4).</li> </ol> </li> <li>7. <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))             <ol style="list-style-type: none"> <li>a. <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau).</li> <li>b. <input type="checkbox"/> have been communicated by the International Bureau.</li> <li>c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</li> <li>d. <input type="checkbox"/> have not been made and will not be made.</li> </ol> </li> <li>8. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).</li> <li>9. <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).</li> <li>10. <input type="checkbox"/> An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).</li> <li>11. <input checked="" type="checkbox"/> A copy of the International Preliminary Examination Report (PCT/IPEA/409).</li> <li>12. <input checked="" type="checkbox"/> A copy of the International Search Report (PCT/ISA/210).</li> </ol>				
<b>Items 13 to 20 below concern document(s) or information included:</b> <ol style="list-style-type: none"> <li>13. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</li> <li>14. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</li> <li>15. <input checked="" type="checkbox"/> A <b>FIRST</b> preliminary amendment.</li> <li>16. <input type="checkbox"/> A <b>SECOND</b> or <b>SUBSEQUENT</b> preliminary amendment.</li> <li>17. <input type="checkbox"/> A substitute specification.</li> <li>18. <input type="checkbox"/> A change of power of attorney and/or address letter.</li> <li>19. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.</li> <li>20. <input type="checkbox"/> A second copy of the published international application under 35 U.S.C. 154(d)(4).</li> <li>21. <input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).</li> <li>22. <input checked="" type="checkbox"/> Certificate of Mailing by Express Mail</li> <li>23. <input checked="" type="checkbox"/> Other items or information:             <ol style="list-style-type: none"> <li>a) Copy of Original Request</li> <li>b) Letter to the Official Draftsman (attaching 5 sheets of drawings - FIGS. 1-5)</li> <li>c) Appendix</li> </ol> </li> </ol>				

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR <b>10/030196</b>	INTERNATIONAL APPLICATION NO. PCT/EP00/05846	ATTORNEY'S DOCKET NUMBER Metal 1285-WCG																
24. The following fees are submitted:		<b>CALCULATIONS PTO USE ONLY</b>																
<b>BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :</b>																		
<input type="checkbox"/> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO ..... <input checked="" type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO ..... <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) ..... <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) .....		<b>\$1040.00</b> <b>\$890.00</b> <b>\$740.00</b> <b>\$710.00</b> <b>\$100.00</b> <b>\$890.00</b> <b>\$0.00</b>																
<b>ENTER APPROPRIATE BASIC FEE AMOUNT =</b>																		
Surcharge of <b>\$130.00</b> for furnishing the oath or declaration later than months from the earliest claimed priority date (37 CFR 1.492 (e)).		<input type="checkbox"/> 20 <input type="checkbox"/> 30 <b>\$0.00</b>																
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">CLAIMS</th> <th style="width: 25%;">NUMBER FILED</th> <th style="width: 25%;">NUMBER EXTRA</th> <th style="width: 25%;">RATE</th> </tr> </thead> <tbody> <tr> <td>Total claims</td> <td>18 - 20 =</td> <td>0</td> <td>x \$18.00    <b>\$0.00</b></td> </tr> <tr> <td>Independent claims</td> <td>3 - 3 =</td> <td>0</td> <td>x \$84.00    <b>\$0.00</b></td> </tr> <tr> <td colspan="3">Multiple Dependent Claims (check if applicable).</td> <td style="text-align: right; vertical-align: bottom;"><input type="checkbox"/>    <b>\$0.00</b></td> </tr> </tbody> </table>		CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	Total claims	18 - 20 =	0	x \$18.00 <b>\$0.00</b>	Independent claims	3 - 3 =	0	x \$84.00 <b>\$0.00</b>	Multiple Dependent Claims (check if applicable).			<input type="checkbox"/> <b>\$0.00</b>	<b>TOTAL OF ABOVE CALCULATIONS =</b> <b>\$890.00</b>
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE															
Total claims	18 - 20 =	0	x \$18.00 <b>\$0.00</b>															
Independent claims	3 - 3 =	0	x \$84.00 <b>\$0.00</b>															
Multiple Dependent Claims (check if applicable).			<input type="checkbox"/> <b>\$0.00</b>															
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27). The fees indicated above are reduced by 1/2.		<b>\$0.00</b>																
		<b>SUBTOTAL =</b> <b>\$890.00</b>																
Processing fee of <b>\$130.00</b> for furnishing the English translation later than months from the earliest claimed priority date (37 CFR 1.492 (f)).		<input type="checkbox"/> 20 <input type="checkbox"/> 30    + <b>\$0.00</b>																
		<b>TOTAL NATIONAL FEE =</b> <b>\$890.00</b>																
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable).		<input type="checkbox"/> <b>\$0.00</b>																
		<b>TOTAL FEES ENCLOSED =</b> <b>\$890.00</b>																
		<b>Amount to be:</b> <b>refunded</b> <b>\$</b> <b>charged</b> <b>\$</b>																
a. <input type="checkbox"/> A check in the amount of _____ to cover the above fees is enclosed. b. <input checked="" type="checkbox"/> Please charge my Deposit Account No. <u>14-1263</u> in the amount of <u>\$890.00</u> to cover the above fees. A duplicate copy of this sheet is enclosed. c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. <u>14-1263</u> . A duplicate copy of this sheet is enclosed. d. <input type="checkbox"/> Fees are to be charged to a credit card. <b>WARNING: Information on this form may become public. Credit card information should not be included on this form.</b> Provide credit card information and authorization on PTO-2038.																		
NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.																		
SEND ALL CORRESPONDENCE TO: <p style="margin-left: 20px;">William C. Gerstenzang NORRIS, MC LAUGHLIN &amp; MARCUS, P.A. 220 East 42nd Street New York, New York 10017 Tel. No.: 212-808-0700 Fax No.: 212-808-0844</p>																		
 SIGNATURE																		
<p><u>William C. Gerstenzang</u> NAME 27,552 REGISTRATION NUMBER January 4, 2002 DATE</p>																		

10/030196  
JC13 Rec'd PCT/PTO 05 JAN 2002

Attorney Docket No.: Metal 1285-WCG  
99 00 17 US / A 7952

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant(s) : Rolf HEDDRICH, Hartmut HOYER and Wolfgang OERTEL  
PCT Application No.: PCT/EP00/05846  
Serial No. : To Be Assigned  
Filed : Herewith  
For : TRACK SUPPORT  
Art Unit : To Be Assigned  
Examiner : To Be Assigned

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January 4, 2002

BOX PCT  
Hon. Assistant Commissioner For Patents  
Washington, D.C. 20231

**PRELIMINARY AMENDMENT**

Sir:

In advance of prosecution, the Examiner is respectfully requested to amend the application as follows and consider the following remarks:

**IN THE CLAIMS**

Please cancel the previous versions of the following claims and replace them with the following rewritten versions. Marked up copies showing the amendment since the previous versions are annexed as separate pages.

Claim 1 (amended). Track support for the track of a magnetic levitation railway, comprised of a steel support, which is optionally fully welded in a fully automatic manner

and has a closed hollow trapezoidal or hollow triangular cross section with closed end faces, the cover plate of which support, forming an upper chord, projects, in the manner of a jib, with its longitudinal edge sections over side wall web plates, which converge at an angle to the mid-vertical plane of the track support, and at each end of which cover plate a side guidance rail is arranged, wherein a stator support web plate, which runs parallel to the mid-vertical plane of the track support, is arranged on the underside of each jib, and between the ground-side end section of which plate and the adjacent side wall web plate on the one hand and the adjacent side guidance rail on the other hand, horizontal plates are provided with formation of closed cavities, with two web flanges running parallel to one another being arranged per jib on the underside of the plates , between which flanges the grooved cross members supporting the stator packs are screwed.

Claim 2 (amended). Track support according to Claim 1, wherein the stator support web plates are arranged in the vertical load plane of the set-down zone of the jib.

Claim 3 (amended). Track support according to Claim 1, wherein the distance of the web flanges from the vertical load plane including the set-down zone is of equal size.

Claim 4 (amended). Track support for the track of a magnetic levitation railway, comprising of a steel support, which is optionally fully welded in a fully automatic manner and has a closed hollow trapezoidal or hollow triangular cross section with closed end faces, the cover plate of which support, forming an upper chord, projects, in the manner

of a jib, with its longitudinal edge sections over the web plates, which form the side walls and which converge at an angle to the mid-vertical plane of the track support, and at each end of which cover plate a side guidance rail is arranged, wherein two stator support web plates installed parallel to the mid-vertical plane of the track support and running at a distance from one another are attached to the underside of each jib and between the ground-side end sections of which plates grooved cross members inserted into the jib-side cross grooves of the stator packs and supporting the latter are screwed, where horizontal plates are attached between the first stator support web plate and the adjacent side wall web plate on the one hand and the other stator support web plate and the adjacent side guidance rails on the other hand, with formation of closed cavities.

Claim 5 (amended). Track support according to Claim 4, wherein the cavity existing between the stator support web plates is closed off by a horizontal plate.

Claim 6 (amended). Track support according to Claim 4, wherein the distance of the stator web plates from the vertical load plane running through the set-down zone is of equal size.

Claim 7 (amended). Track support for the track of a magnetic levitation railway, consisting of a steel support, which is optionally fully welded in a fully automatic manner and has a closed hollow trapezoidal or hollow triangular cross section with closed end faces, the cover plate of which support, forming an upper chord, projects, in the manner of a jib, with its longitudinal edge sections over the side wall web plates, which converge at an angle to the mid-vertical plane of the track support, and at each end of which cover plate a side

guidance rail is arranged, wherein stator support web plates, which are brought together at an acute angle of from 15 to 30°, are attached to the underside of the jibs beneath the set-down zone, and between the ground-side end sections of these plates are screwed grooved cross members, which are inserted into the jib-side cross grooves of the stator packs and support the latter, with horizontal plates being attached between the first stator support web plate and the adjacent side wall web plate on the one hand and the other stator support web plate and the adjacent side guidance rail on the other hand, with formation of closed cavities.

Claim 8 (amended). Track support according to Claim 7, wherein the line bisecting the angle between the stator support web plates, which converge at an acute angle, runs in the vertical load plane of the set-down zone.

Claim 9 (amended). Track support according to Claim 7, wherein the cavity existing between the stator support web plates is closed at the bottom by a horizontally arranged plate.

Claim 10 (amended). Track support according to Claim 1, further comprising holes installed in the web flanges or the stator support web plates and corresponding to threaded holes present in the grooved cross members, into which holes the bolts are inserted.

Claim 11 (amended). Track support according to Claim 10, wherein blind holes are arranged in the web flanges or the stator support web plates axially parallel to the bolts in the grooved cross members, into each of which blind holes a fixing pin is inserted with

formation of an annular space having a width of from 0.5 to 5 mm and is pressed into holes of the web flange or stator support web plates which correspond to the blind holes.

Claim 12 (amended). Track support according to Claim 10, further comprising washers installed beneath the heads of the bolts and which cover a segment of the holes installed in the web flanges or the stator support web plates for the fixing pins.

Please add the following:

--Claim 13. The track support of Claim 2, wherein the distance of the web flanges from the vertical load plane including the set-down zone is of equal size.

Claim 14. The track support of Claim 5, wherein the distance of the stator web plates from the vertical load plane running through the set-down zone is of equal size.

Claim 15. The track support of Claim 8, wherein the cavity existing between the stator support web plates is closed at the bottom by a horizontally arranged plate.

Claim 16. The track support of Claim 4, further comprising holes installed in the web flanges or the stator support web plates and corresponding to threaded holes present in the grooved cross members, into which holes the bolts are inserted.

Claim 17. The track support of Claim 7, further comprising holes installed in the web flanges or the stator support web plates and corresponding to threaded holes present

in the grooved cross members, into which holes the bolts are inserted.

Claim 18. The track support of Claim 11, further comprising washers installed beneath the heads of the bolts and which cover a segment of the holes installed in the web flanges or the stator support web plates for the fixing pins.--

REMARKS

This Preliminary Amendment is being filed to eliminate multiple dependency, and to present the claims in proper format for domestic prosecution.

For the record, Applicants emphasize that although the claims were amended, and, therefore, might be argued to have been amended for a reason substantially related to patentability, a fair reading of the amended claims will reveal that the departures from the previous claims were for clarification purposes only, and that Applicants did not narrow the claims in any material respect. Therefore, Applicants submit that the amended claims are entitled to the full range of equivalents.

Favorable action is respectfully solicited.

ADDITIONAL FEE

Please charge any insufficiency of fees, or credit any excess, to Deposit Account No.  
14-1263.

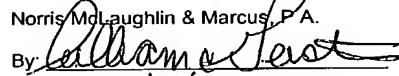
Respectfully submitted,

NORRIS, McLAUGHLIN & MARCUS, P.A.

By   
William C. Gerstenzang  
Reg. No. 27,552

220 East 42nd Street - 30th Floor  
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I hereby certify that this paper is being deposited with the United States Postal Service as Express Mail, Label No. EV 015940897US to. BOX PCT, Hon. Assistant Commissioner for Patents, Washington, D.C. 20231 on January 4, 2002.

Norris McLaughlin & Marcus, P.A.  
By   
Date: 1/4/02

**MARKED-UP COPIES OF AMENDED CLAIMS,**  
**SHOWING CHANGES RELATIVE TO PREVIOUS VERSION**

Claim 1 (amended). Track support [(1)] for the track of a magnetic levitation railway, [consisting] comprised of a steel support, which is [preferably] optionally fully welded in a fully automatic manner and has a closed hollow trapezoidal or hollow triangular cross section with closed end faces, the cover plate [(2)] of which support, forming [the] an upper chord, projects, in the manner of a jib [(7, 8)], with its longitudinal edge sections over [the] side wall web plates [(4,5)], which converge at an angle to the mid-vertical plane [(3)] of the track support, and at each end of which cover plate a side guidance rail [(9, 10)] is arranged, [characterized in that] wherein a stator support web plate [(11, 12)], which runs parallel to the mid-vertical plane [(3)] of the track support [(1)], is arranged on the underside of each jib [(7, 8)], and between the ground-side end section of which plate and the adjacent side wall web plate [(4, 5)] on the one hand and the adjacent side guidance rail [(9, 10)] on the other hand, horizontal plates [(13, 14, 15, 16)] are provided with formation of closed cavities [(17, 18, 19, 20)], with two web flanges [(23, 24, 25, 26)] running parallel to one another being arranged per jib on the underside of the plates [(13, 14, 15, 16)], between which flanges the grooved cross members [(29)] supporting the stator packs [(27, 28)] are screwed.

Claim 2 (amended). Track support according to Claim 1, [characterized in that] wherein the stator support web plates [(11, 12)] are arranged in the vertical load plane [(21, 22)] of the set-down zone of the jib [(7, 8)].

Claim 3 (amended). Track support according to [one of Claims 1 and 2, characterized in that] Claim 1, wherein the distance of the web flanges [(23, 24, 25, 26)] from the vertical load plane [(21, 22)] including the set-down zone is of equal size.

Claim 4 (amended). Track support [(1)] for the track of a magnetic levitation railway, [consisting] comprising of a steel support, which is [preferably] optionally fully welded in a fully automatic manner and has a closed hollow trapezoidal or hollow triangular cross section with closed end faces, the cover plate [(2)] of which support, forming [the] an upper chord, projects, in the manner of a jib [(7, 8)], with its longitudinal edge sections over the web plates [(4,5)], which form the side walls and which converge at an angle to the mid-vertical plane [(3)] of the track support, and at each end of which cover plate a side guidance rail [(9, 10)] is arranged, [characterized in that] wherein two stator support web plates [(45, 46)] installed parallel to the mid-vertical plane [(3)] of the track support [(1)] and running at a distance from one another are attached to the underside of each jib [(7, 8)] and between the ground-side end sections of which plates [the] grooved cross members [(29)] inserted into the jib-side cross grooves of the stator packs [(27, 28)] and supporting the latter are screwed, where horizontal plates [(49, 50)] are attached between the first stator support web plate [(45)] and the adjacent side wall web plate [(5)] on the one hand and the other stator support web plate [(46)] and the adjacent side guidance rails [(10)] on the other hand, with formation of closed cavities [(47, 48)].

Claim 5 (amended). Track support according to Claim 4, [characterized in that] wherein the cavity [(51)] existing between the stator support web plates [(45, 46)] is closed

off by a horizontal plate.

Claim 6 (amended). Track support according to [one of Claims 4 and 5, characterized in that] Claim 4, wherein the distance of the stator web plates [(45, 46)] from the vertical load plane [(22)] running through the set-down zone is of equal size.

Claim 7 (amended). Track support [(1)] for the track of a magnetic levitation railway, consisting of a steel support, which is [preferably] optionally fully welded in a fully automatic manner and has a closed hollow trapezoidal or hollow triangular cross section with closed end faces, the cover plate [(2)] of which support, forming [the] an upper chord, projects, in the manner of a jib [(7, 8)], with its longitudinal edge sections over the side wall web plates [(4,5)], which converge at an angle to the mid-vertical plane [(3)] of the track support, and at each end of which cover plate a side guidance rail [(9, 10)] is arranged, [characterized in that] wherein stator support web plates [(52, 53)], which are brought together at an acute angle of from 15 to 30°, are attached to the underside of the jibs [(7, 8)] beneath the set-down zone, and between the ground-side end sections of these plates are screwed [the] grooved cross members [(29)], which are inserted into the jib-side cross grooves of the stator packs [(27, 28)] and support the latter, with horizontal plates [(56, 57)] being attached between the first stator support web plate [(52)] and the adjacent side wall web plate [(5)] on the one hand and the other stator support web plate [(53)] and the adjacent side guidance rail [(10)] on the other hand, with formation of closed cavities [(54, 55)].

Claim 8 (amended). Track support according to Claim 7, [characterized in that] wherein the line bisecting the angle between the stator support web plates [(52, 53)], which converge at an acute angle, runs in the vertical load plane [(22)] of the set-down zone.

Claim 9 (amended). Track support according to [one of Claims 7 and 8, characterized in that] Claim 7, wherein the cavity [(58)] existing between the stator support web plates [(52, 53)] is closed at the bottom by a horizontally arranged plate [(59)].

Claim 10 (amended). Track support according to [one of Claims 1 to 9, characterized by] Claim 1, further comprising holes [(32, 33)] installed in the web flanges [(25, 26)] or the stator support web plates [(45, 46, 52, 53)] and corresponding to threaded holes [(34)] present in the grooved cross members [(29)], into which holes [(32, 33)] the bolts [(30, 31)] are inserted.

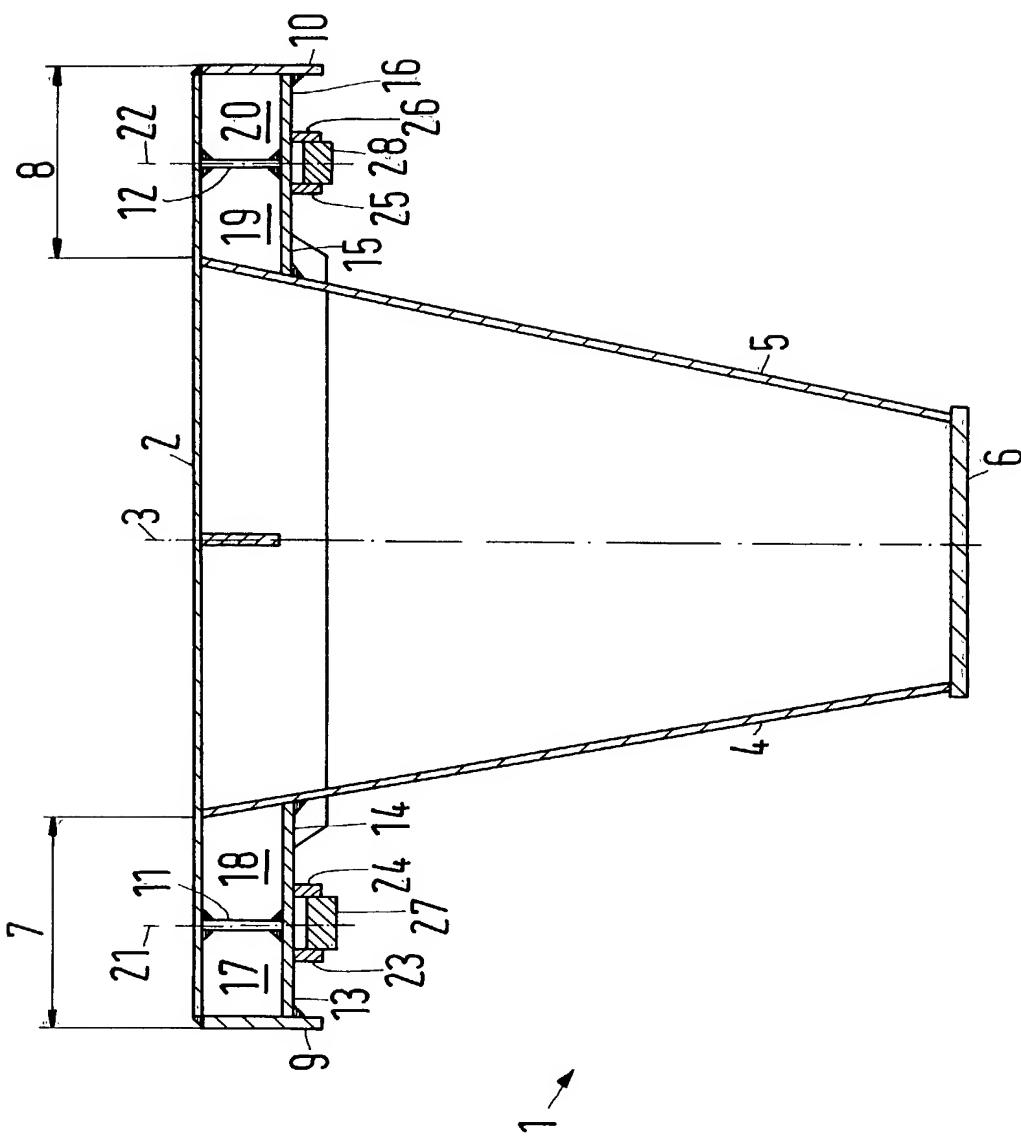
Claim 11 (amended). Track support according to Claim 10, [characterized by] wherein blind holes [(41, 42)] are arranged in the web flanges [(25, 26)] or the stator support web plates [(45, 46, 52, 53)] axially parallel to the bolts [(30, 31)] in the grooved cross members [(29)], into each of which blind holes a fixing pin [(35, 36)] is inserted with formation of an annular space [(39, 40)] having a width of from 0.5 to 5 mm and is pressed into holes [(37, 38)] of the web flange or stator support web plates which correspond to the blind holes.

Claim 12 (amended). Track support according to [one of Claims 10 and 11,

characterized by] Claim 10, further comprising washers [(43, 44), which are] installed beneath the heads of the bolts [(30, 31)] and which cover a segment of the holes [(37, 38)] installed in the web flanges [(25, 26)] or the stator support web plates [(45, 46, 52, 53)] for the fixing pins [(35, 36)].

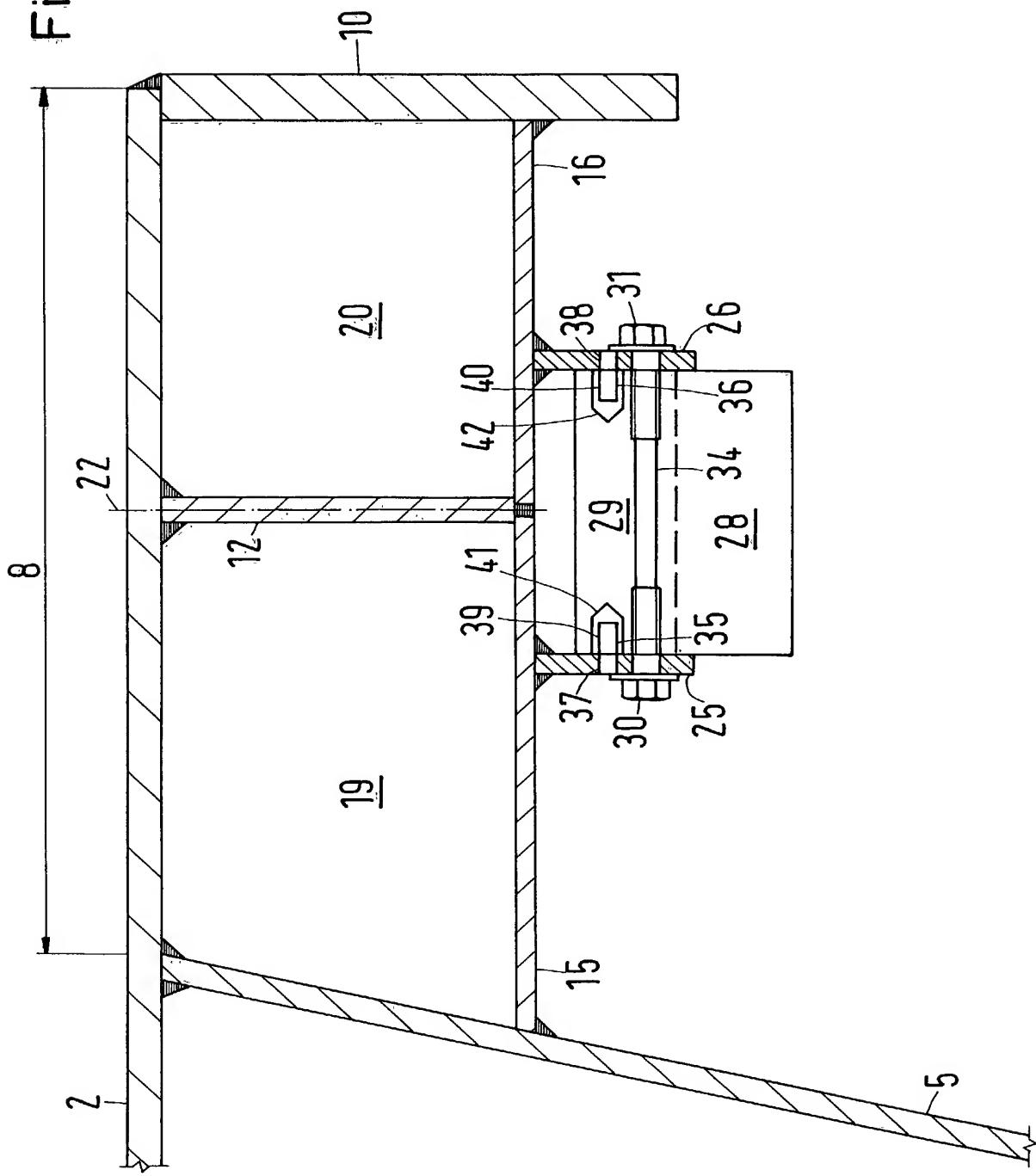
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Fig.1

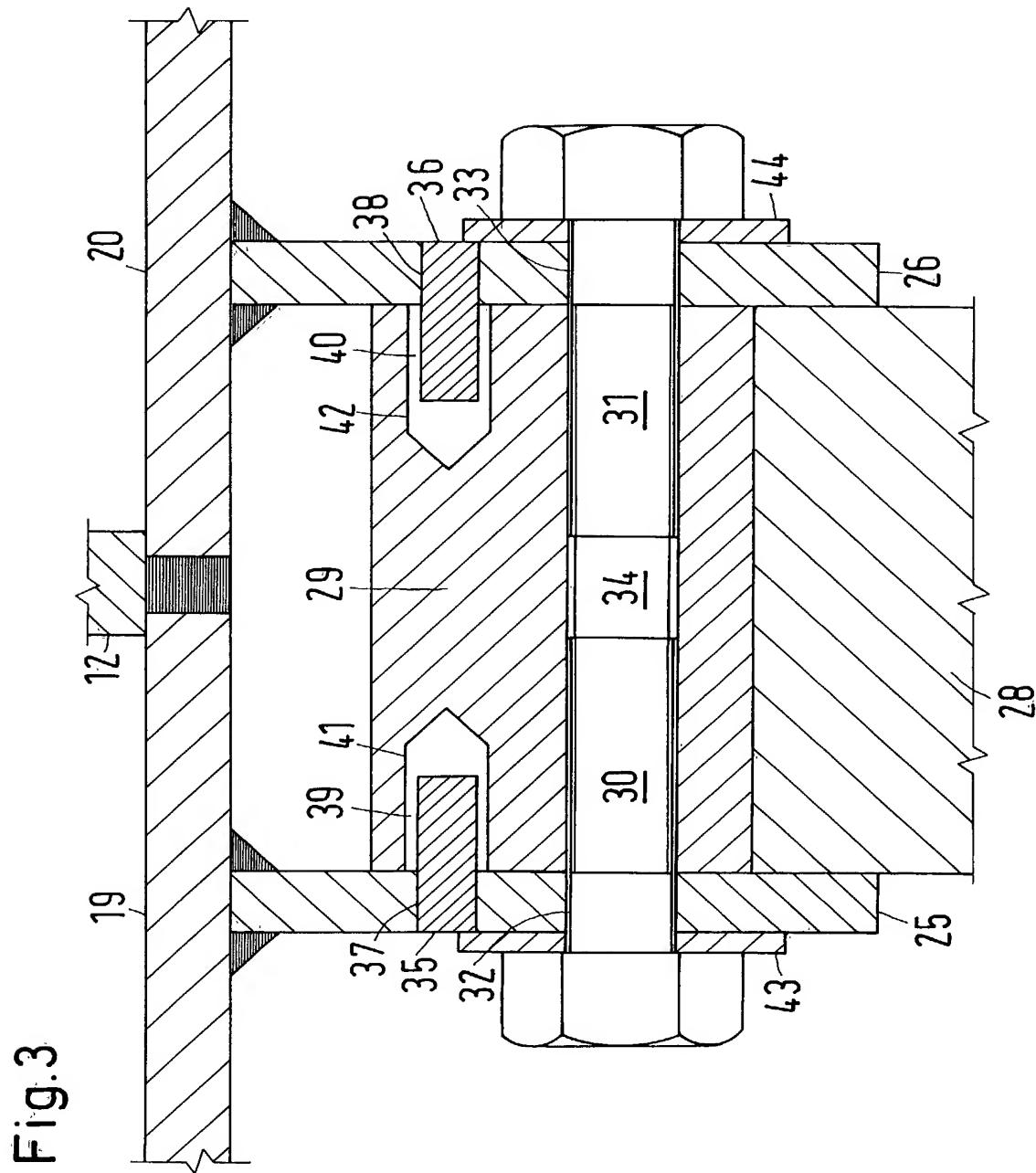


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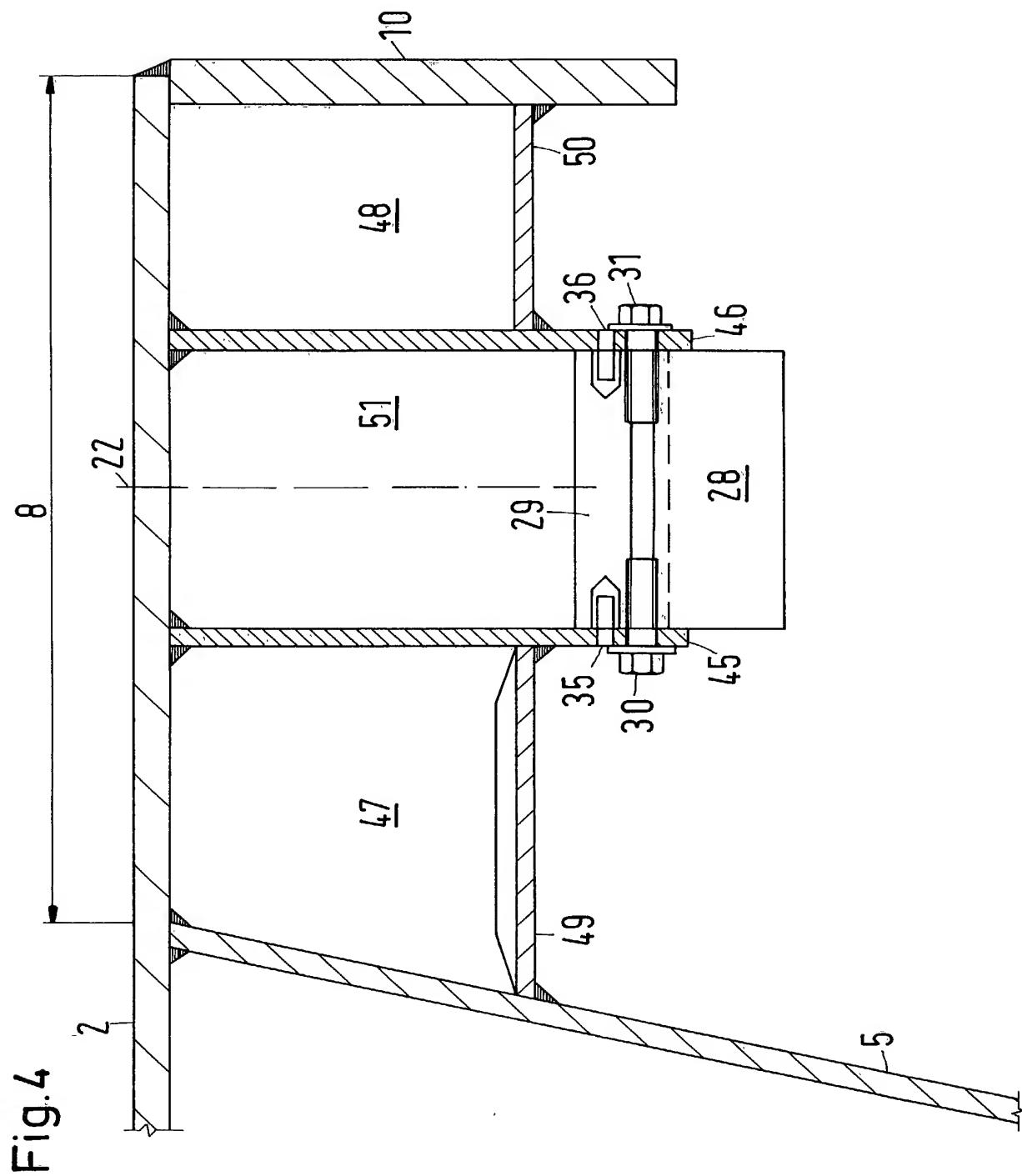
Fig.2



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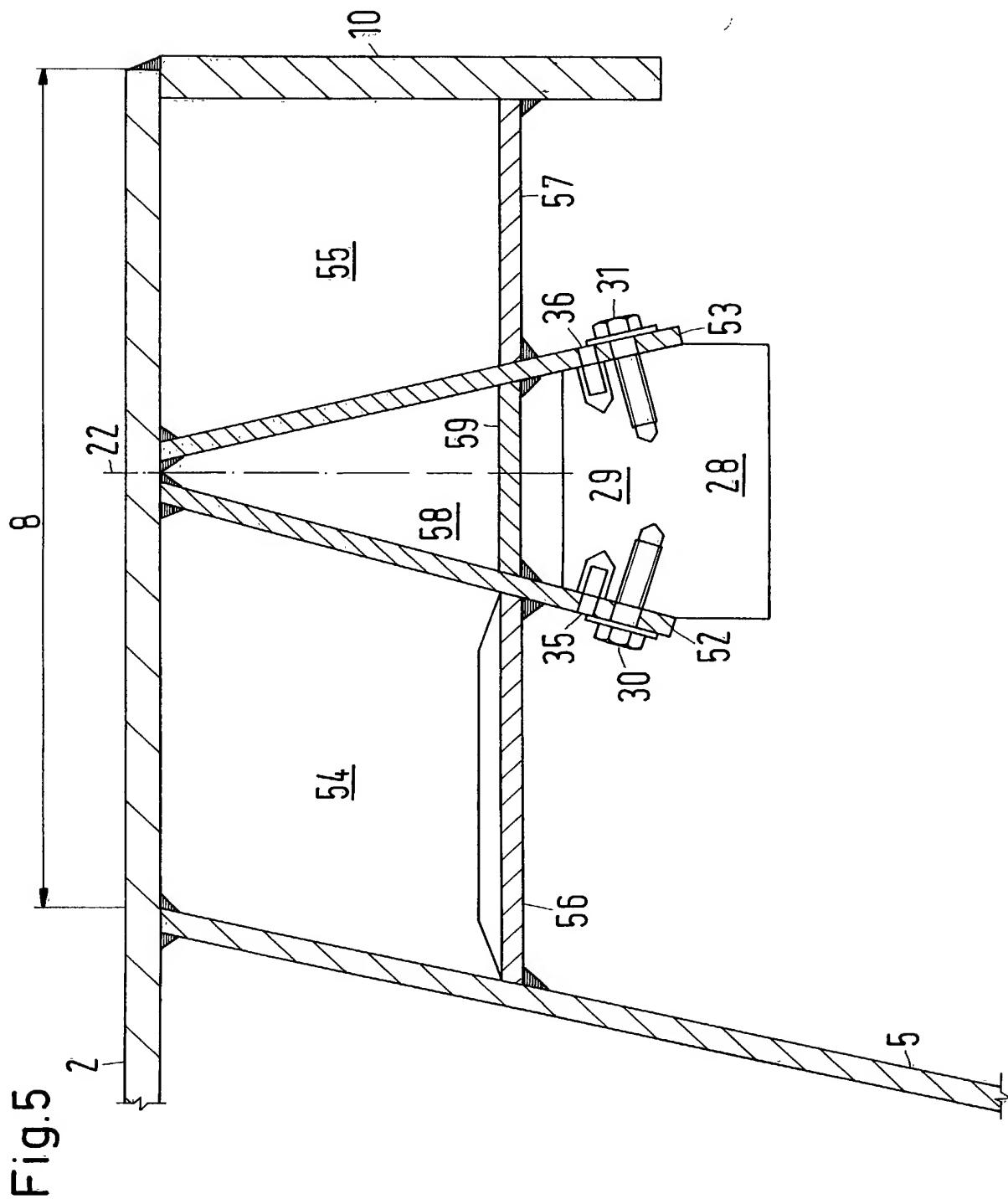


Fig.5

5/Pvt/s

Track Support

Description

The invention relates to a track support for the track of a magnetic levitation railway, consisting of a steel support, which is preferably fully welded in a fully automatic manner and has a closed hollow trapezoidal or hollow triangular cross section with closed end faces, the cover plate of which support, forming the upper chord, projects laterally, in the manner of a jib, with its longitudinal edge sections over the web plates, which form the side walls and which converge at an angle from the underside of the cover plate to the mid-vertical plane of the track support, and to each end of which cover plate a side guidance rail is attached.

The magnetic levitation railway is a track-guided transport system with non-contact levitation, guidance and propulsion technology. The levitation and guidance system works on the principle of electromagnetic levitation, which is based on the attractive forces between the lacuna in the underbody of the vehicle and the ferromagnetic reaction rails, the so-called stator packs, which are installed beneath the track. The levitation magnets attract the vehicle to the track from beneath, and the guidance magnets installed at the side hold the vehicle laterally in the track. The levitation and guidance magnets are arranged over the entire length of the vehicle on both sides. The essential element of this technology comprises the track supports forming the track, which take on the functions of support, guidance and levitation of the vehicle and transmit the loads via the main supporting framework to the bearings; from there, the loads are passed to the ground via the substructures and the foundations.

The torsionally rigid steel track supports, which are generally fully welded in a fully automatic manner and have a hollow triangular or hollow trapezoidal cross section with closed end faces, for the track of a magnetic levitation railway, consisting of a cover plate with a thickness of from 15 to 25 mm, which forms the upper chord and to which the web plates having a thickness of from 10 to 20 mm, which form the side walls and which converge at an angle to the mid-vertical plane of the track support, are connected in a downward direction. In the case of the track support with a hollow triangular cross section, the lower chord consists of a tube, and in the case of the track support having a hollow trapezoidal cross section, the lower chord consists of a base plate with a thickness of from 30 to 50 mm. The longitudinal edge sections of the cover plate, which project over each of the side wall web plates in the manner of a jib, are stiffened by cross-supports or bulkheads installed at intervals and at the same time serve to connect the functional components corresponding to the levitation and guidance system of the vehicle, essentially consisting of stator packs with cable windings and the guidance rails, which are connected via anchoring supports to double-T supports attached to the jibs (ref.: Eisenbahntechnische Rundschau, ETR 33, 1984, issue 6, pp. 487 to 492, in particular pp. 488/89).

Based on this prior art, DE-C-19735471 discloses a track support in which the side guidance rails are mounted directly at the ends of the cover plate jibs projecting over the lateral side wall web plates. The stator packs with a length of about 1 m, which consist of plastic-bonded and encapsulated electric steel plates are arranged on both sides of the track support beneath the jibs along the entire track. Via three grooved cross members, which are bonded in an interlocking manner in the jib-facing side of each stator pack, these stator packs are attached, in each

case by means of two bolts, to the stator support chord, which is connected to the stator support web, which is arranged on the underside of the jib and runs parallel to the mid-vertical plane of the track support. The grooved cross members and the grooves accommodating these in the stator support chord form a redundant attachment in addition to the bolt.

Since the function and operational strength of the track supports forming the track must be guaranteed for the service life of at least 80 years, all surfaces of the track support have to be automatically blasted and cleaned in accordance with DIN 55928, Part 4, with a standard cleanliness of SA 2 ½ or greater by means of one or more freely programmable handling devices. A primer coat of zinc dust and three further coats of iron mica are subsequently applied to the surfaces prepared in this way by means of one or more freely programmable handling devices. In order to meet the requirement for a service life of 80 years, maintenance and inspection, where necessary together with repair work of the track, is necessary at regular intervals.

The object of the present invention is to keep the surfaces of the track support described at the outset which are exposed to environmental influences as small as possible with optimized use of materials and to simplify and qualitatively improve the attachment of the stators.

This object is achieved by a combination of features indicated in Claims 1, 4 or 7.

Claims 2, 3, 5, 6, 9 and 10 preferably give embodiments of the combinations of features according to the invention.

The invention is explained in greater detail below by means of illustrative embodiments,

in which:

Fig. 1 shows a cross section through a track support.

Fig. 2 shows an enlarged partial section of the track support design in the region of the jib shown in Fig. 1

Fig. 3 shows an enlarged depiction of detail X in Fig. 2

Fig. 4 shows an enlarged partial section of the track support design modified compared with Fig. 2 in the region of the jib.

Fig. 5 shows an enlarged partial section of the track support design modified compared with Fig. 2 in the region of the jib.

The torsionally rigid steel track support (1), which is fully welded in a fully automatic manner and which has a closed hollow trapezoidal cross section, consists of a cover plate (2), which forms the upper chord, the web plates (4, 5), which form the side walls, are mounted on the underside of the cover plate (2) and converge at an angle to the mid-vertical plane (3) of the track support (1), and the base plate (6), which is connected to the web plates at the bottom and forms the lower chord. The longitudinal edge sections of the cover plate (2) project laterally over the web plates (4, 5) in the manner of a jib (7, 8) and carry at their ends in each case a side guidance rail (9, 10). A stator support web plate (11, 12), which runs parallel to the mid-vertical plane (3) of the track support (1), is mounted on the underside of each jib (7, 8) beneath the set-down zone of the jib (7, 8), and horizontal plates (13, 14, 15, 16), by means of which the cavities (17, 18, 19, 20) are closed on the ground side, are arranged between the end of the web plate on the ground side and

the adjacent side wall web plate (4, 5) on the one hand and the adjacent side guidance rail (9, 10) on the other hand. Two web flanges (23, 24, 25, 26), which run parallel to the vertical load plane (21, 22) passing through the set-down zone and at the same distance from the vertical load plane, and between which the stator packs (27, 28) are attached, are located on the underside of each plate (13, 14, 15, 16). The stator packs (27, 28) are provided with three cross grooves on the jib side, into each of which a grooved cross member (29) is inserted and connected to the web flanges (25, 26) in a frictional and interlocking manner by means of a high-strength bolt (30, 31). The bolts (30, 31) inserted through corresponding holes (32, 33) in the web flange (25, 26) are screwed in the through holes (34), running perpendicular to the web flanges (25, 26), with internal thread of the grooved cross members (29). A redundant attachment of the grooved cross members (29) takes place through fixing pins (35, 36), which are arranged above the bolts (30, 31) in the vertical plane including the latter, are pressed into the holes (37) (38) located in the web flanges (25, 26) and project into the blind holes (41, 42) located in the grooved cross member with formation of an annular space (39, 40). As additional security against the falling-out of fixing pins (35, 36) which may have been loosened, washers (43) (44) are installed beneath each of the heads of the bolts (30, 31) and cover a segment of the holes (37, 38) located in the web flanges (25, 26) for the fixing pins (35, 36). In the event of both bolts (30, 31) failing, the stator pack accordingly drops by about 2 mm until the fixing pins (35, 36) are locked in the blind holes (41, 40).

A modification of the above-described fitting of the track support (1) consists, according to Fig. 4, of two stator support web plates (45, 46) attached to the underside of each jib (7, 8) and running parallel at a distance from one another and from the mid-vertical

plane (3) of the track support (1), between the ground-side end sections of which plates, which are screwed in an interlocking and frictional manner, as shown above in detail, to the grooved cross members (29), which are inserted into the jib-side cross grooves of the stator packs (27, 28) and support the latter. The cavities (47) (48) present between the side wall web plates (5) and the respectively adjacent stator support web plate (45) on the one hand and the side guidance rails (10) and the respectively adjacent stator support web plate (46) are closed on the ground side by plates (49, 50) attached to the mid-vertical plane (3) of the track support (1). It is not shown in the drawing that the cavity (51) present between the stator support web plates (45, 46) above the grooved cross members (29) can also be closed by attachment of a corresponding plate.

A further modification of the embodiment shown in Fig. 1 to Fig. 3 of the fitting of the track support (1) consists, as shown in Fig. 5, in that two stator support web plates (52, 53) are attached to the underside of each jib (7, 8) in the region beneath the set-down zone and form an angle of 15° to the mid-vertical load plane (22) running through the set-down zone and the grooved cross members (29), which are inserted into the jib-side cross grooves of the stator packs (27, 28) and support the latter, are screwed in an interlocking and frictional manner between the ground-side end sections of these plates. In accordance with the angle of the two stator support web plates (52, 53) formed with the mid-vertical load plane (22), the front faces of the grooved cross members (29) are inclined at an angle of 75°. The cavities (54, 55) present between the web plates (4, 5) and the respectively adjacent stator support web plates (52) on the one hand, and the side guidance rails (9, 10) and the respectively adjacent stator support web plates (53) on the other hand are closed on the ground side by

plates (56, 57) attached perpendicularly to the mid-vertical plane (3) of the track support (1). The cavity (58) enclosed by the two stator support web plates (52, 53) is closed by a plate (59) attached above the grooved cross members (29).

The advantages achieved by means of the device according to the invention are to be regarded, in particular, as being that, with optimized use of materials, the surfaces of the track support which are relatively difficult to access are not subject to environmental influences. The qualitatively better attachment of the stators is possible with significantly less effort.

Patent Claims

1. Track support (1) for the track of a magnetic levitation railway, consisting of a steel support, which is preferably fully welded in a fully automatic manner and has a closed hollow trapezoidal or hollow triangular cross section with closed end faces, the cover plate (2) of which support, forming the upper chord, projects, in the manner of a jib (7, 8), with its longitudinal edge sections over the side wall web plates (4,5), which converge at an angle to the mid-vertical plane (3) of the track support, and at each end of which cover plate a side guidance rail (9, 10) is arranged, characterized in that a stator support web plate (11, 12), which runs parallel to the mid-vertical plane (3) of the track support (1), is arranged on the underside of each jib (7, 8), and between the ground-side end section of which plate and the adjacent side wall web plate (4, 5) on the one hand and the adjacent side guidance rail (9, 10) on the other hand, horizontal plates (13, 14, 15, 16) are provided with formation of closed cavities (17, 18, 19, 20), with two web flanges (23, 24, 25, 26) running parallel to one another being arranged per jib on the underside of the plates (13, 14, 15, 16), between which flanges the grooved cross members (29) supporting the stator packs (27, 28) are screwed.
2. Track support according to Claim 1, characterized in that the stator support web plates (11, 12) are arranged in the vertical load plane (21, 22) of the set-down zone of the jib (7, 8).
3. Track support according to one of Claims 1 and 2, characterized in that the distance of the web flanges (23, 24, 25, 26) from the vertical load

plane (21, 22) including the set-down zone is of equal size.

4. Track support (1) for the track of a magnetic levitation railway, consisting of a steel support, which is preferably fully welded in a fully automatic manner and has a closed hollow trapezoidal or hollow triangular cross section with closed end faces, the cover plate (2) of which support, forming the upper chord, projects, in the manner of a jib (7, 8), with its longitudinal edge sections over the web plates (4,5), which form the side walls and which converge at an angle to the mid-vertical plane (3) of the track support, and at each end of which cover plate a side guidance rail (9, 10) is arranged, characterized in that two stator support web plates (45, 46) installed parallel to the mid-vertical plane (3) of the track support (1) and running at a distance from one another are attached to the underside of each jib (7, 8) and between the ground-side end sections of which plates the grooved cross members (29) inserted into the jib-side cross grooves of the stator packs (27, 28) and supporting the latter are screwed, where horizontal plates (49, 50) are attached between the first stator support web plate (45) and the adjacent side wall web plate (5) on the one hand and the other stator support web plate (46) and the adjacent side guidance rails (10) on the other hand, with formation of closed cavities (47, 48).
5. Track support according to Claim 4, characterized in that the cavity (51) existing between the stator support web plates (45, 46) is closed off by a horizontal plate.

6. Track support according to one of Claims 4 and 5, characterized in that the distance of the stator web plates (45, 46) from the vertical load plane (22) running through the set-down zone is of equal size.
7. Track support (1) for the track of a magnetic levitation railway, consisting of a steel support, which is preferably fully welded in a fully automatic manner and has a closed hollow trapezoidal or hollow triangular cross section with closed end faces, the cover plate (2) of which support, forming the upper chord, projects, in the manner of a jib (7, 8), with its longitudinal edge sections over the side wall web plates (4,5), which converge at an angle to the mid-vertical plane (3) of the track support, and at each end of which cover plate a side guidance rail (9, 10) is arranged, characterized in that stator support web plates (52, 53), which are brought together at an acute angle of from 15 to 30°, are attached to the underside of the jibs (7, 8) beneath the set-down zone, and between the ground-side end sections of these plates are screwed the grooved cross members (29), which are inserted into the jib-side cross grooves of the stator packs (27, 28) and support the latter, with horizontal plates (56, 57) being attached between the first stator support web plate (52) and the adjacent side wall web plate (5) on the one hand and the other stator support web plate (53) and the adjacent side guidance rail (10) on the other hand, with formation of closed cavities (54, 55).
8. Track support according to Claim 7, characterized in that the line bisecting the angle between the stator support web plates (52, 53), which converge at an acute angle, runs in the vertical load plane (22) of the set-down zone.

9. Track support according to one of Claims 7 and 8, characterized in that the cavity (58) existing between the stator support web plates (52, 53) is closed at the bottom by a horizontally arranged plate (59).
10. Track support according to one of Claims 1 to 9, characterized by holes (32, 33) installed in the web flanges (25, 26) or the stator support web plates (45, 46, 52, 53) and corresponding to threaded holes (34) present in the grooved cross members (29), into which holes (32, 33) the bolts (30, 31) are inserted.
11. Track support according to Claim 10, characterized by blind holes (41, 42) arranged in the web flanges (25, 26) or the stator support web plates (45, 46, 52, 53) axially parallel to the bolts (30, 31) in the grooved cross members (29), into each of which blind holes a fixing pin (35, 36) is inserted with formation of an annular space (39, 40) having a width of from 0.5 to 5 mm and is pressed into holes (37, 38) of the web flange or stator support web plates which correspond to the blind holes.
12. Track support according to one of Claims 10 and 11, characterized by washers (43, 44), which are installed beneath the heads of the bolts (30, 31) and which cover a segment of the holes (37, 38) installed in the web flanges (25, 26) or the stator support web plates (45, 46, 52, 53) for the fixing pins (35, 36).

### Abstract

A track support for the track of a magnetic levitation railway consists of a steel support having a closed hollow trapezoidal or hollow triangular cross section with closed end faces, whose cover plate projects, in the manner of a jib, with its longitudinal edge sections over the side wall web plates, and at the end of which cover plate a side guidance rail is arranged in each case. In order to keep the surfaces of the track support that are exposed to environmental influences as small as possible, a stator support web plate is arranged on the underside of each jib, between the ground-side end section of which plate and the adjacent side wall web plate and the adjacent side guidance rail horizontal plates are arranged, forming closed cavities, where two parallel web flanges between which the grooved cross members are screwed are provided per jib on the underside of the plates.

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JC13 Rec'd PCT/PTO 05 JAN 2002

Attorney Docket No.: Metal 1285-WCG  
99 00 17 US / A 7952

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant(s) : Rolf HEDDRICH, Hartmut HOYER and Wolfgang OERTEL  
PCT Application No. : PCT/EP00/05846  
Serial No. : To Be Assigned  
Filed : Herewith  
For : TRACK SUPPORT  
Art Unit : To Be Assigned  
Examiner : To Be Assigned

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January 4, 2002

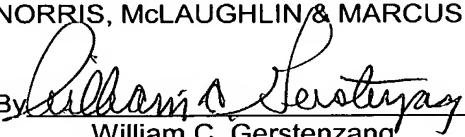
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Sir:

**LETTER TO THE OFFICIAL DRAFTSMAN**

Submitted herewith for entry and approval are five (5) sheets of formal drawings (FIGS. 1-5) in the above-referenced application.

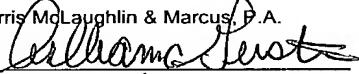
Respectfully submitted,  
NORRIS, McLAUGHLIN & MARCUS, P.A.

By   
William C. Gerstenzang  
Reg. No. 27,552

WCG:gb  
Enc. - Formal Drawings (5 sheets)

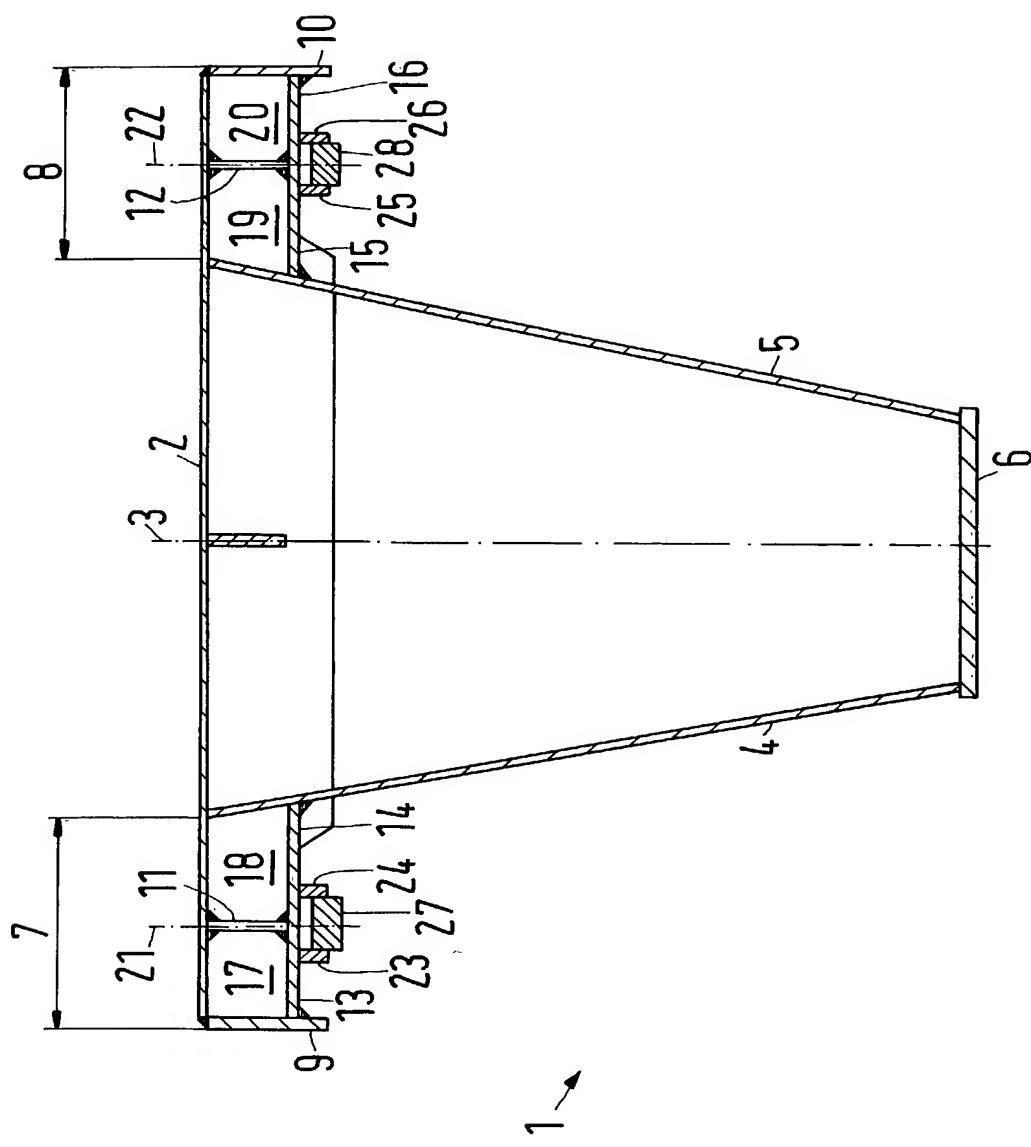
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Norris McLaughlin & Marcus, P.A.  
By   
Date: 1/4/02

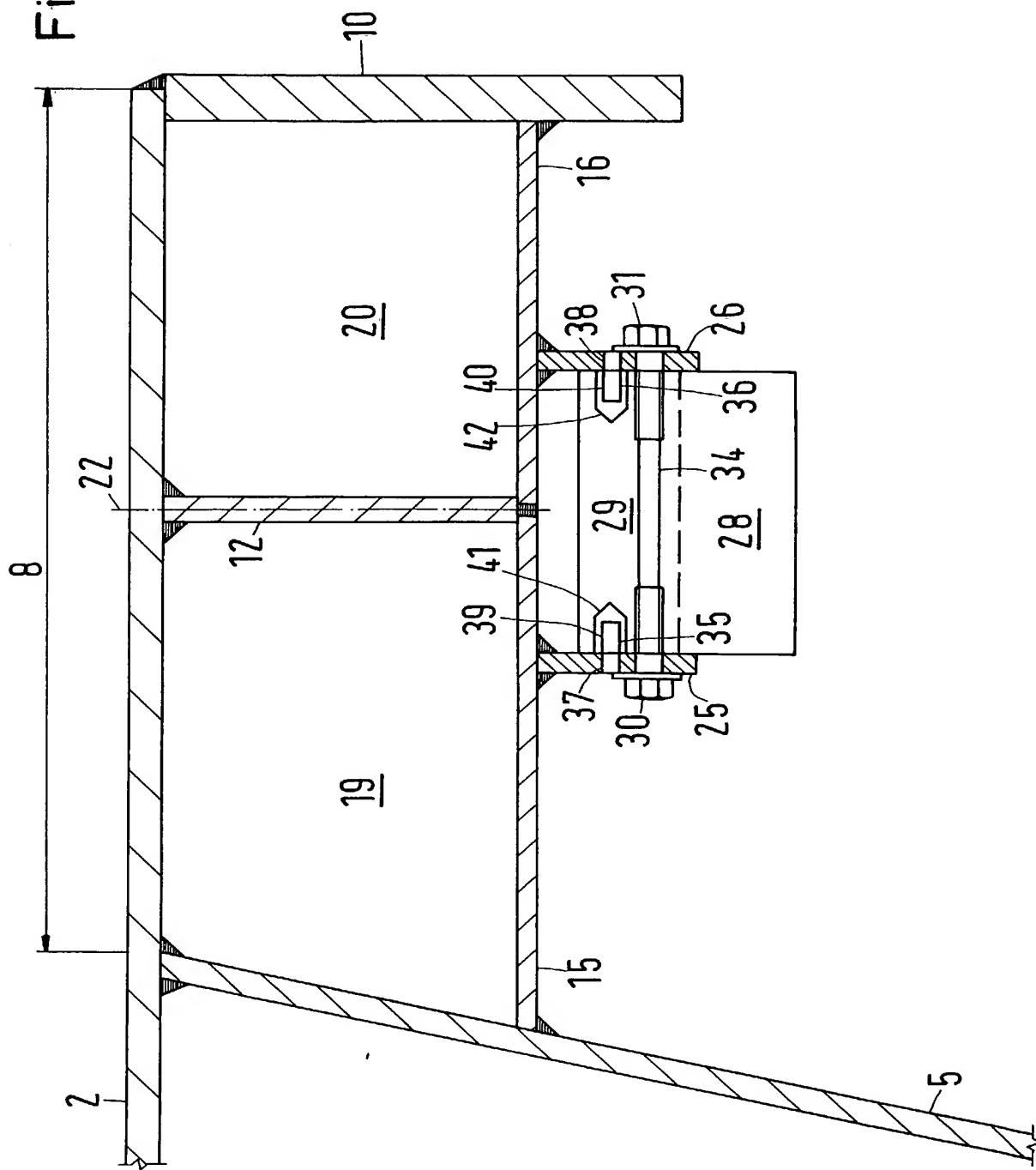
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Fig.1

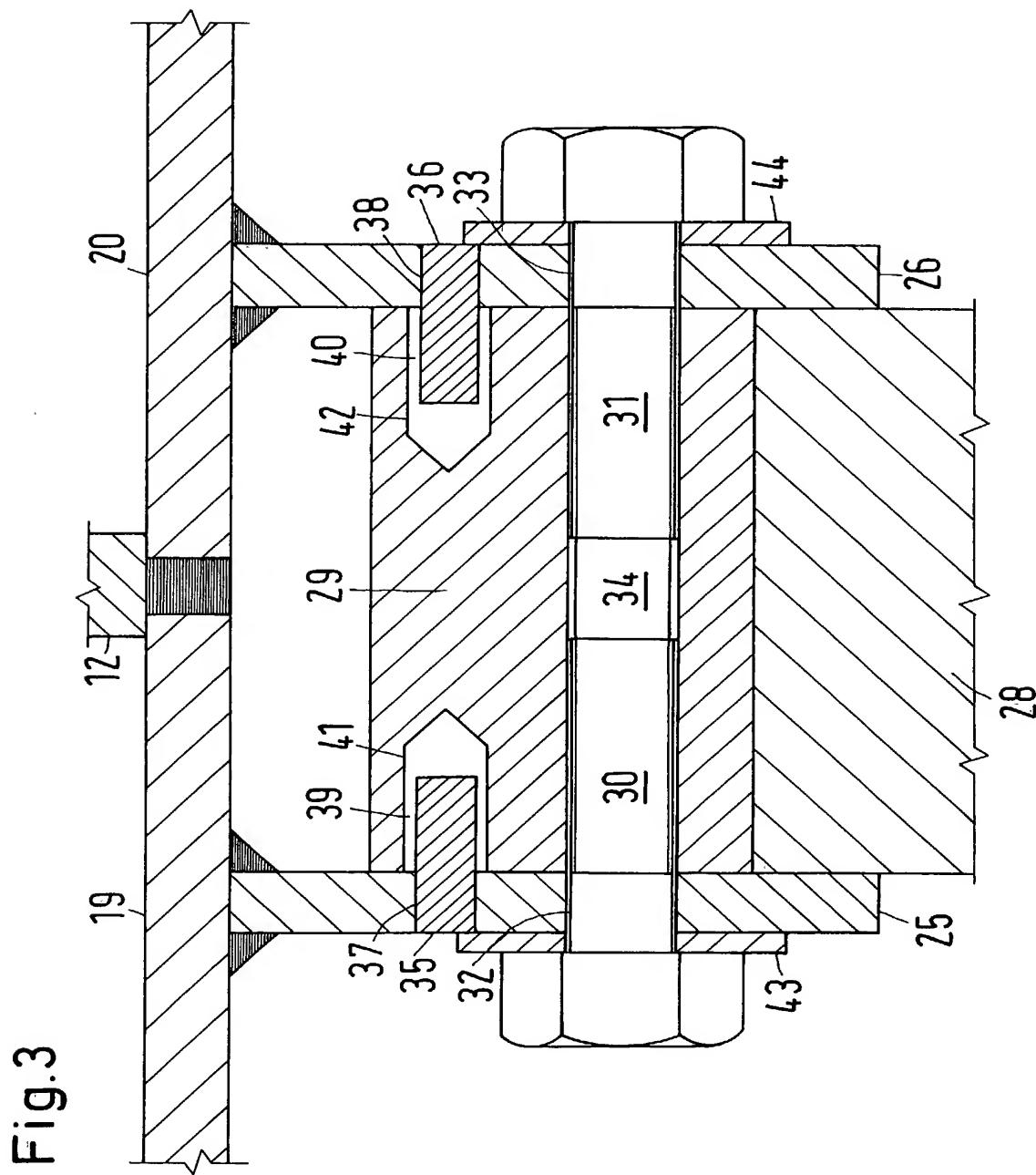


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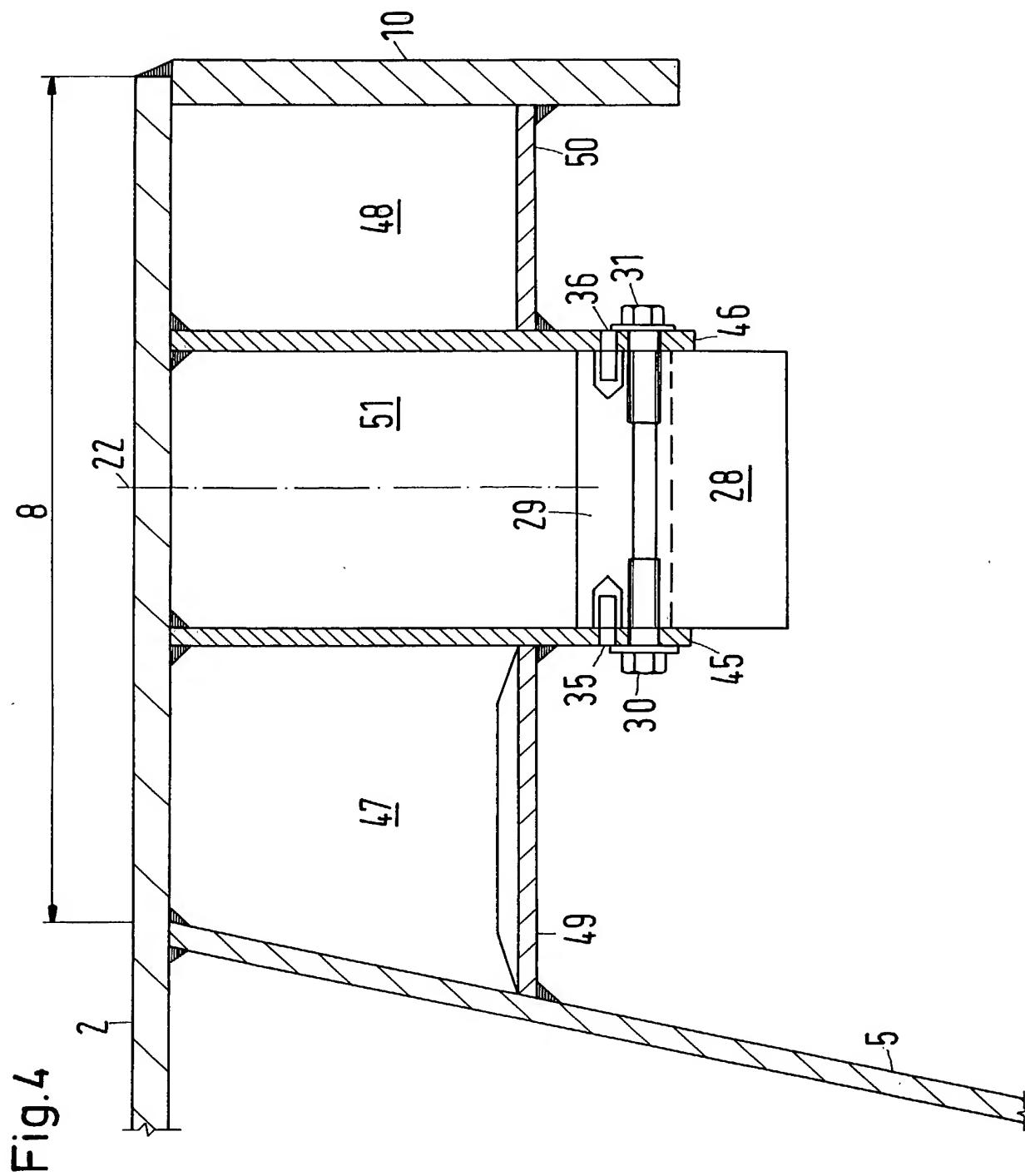
Fig.2



3/5



4/5



5/5

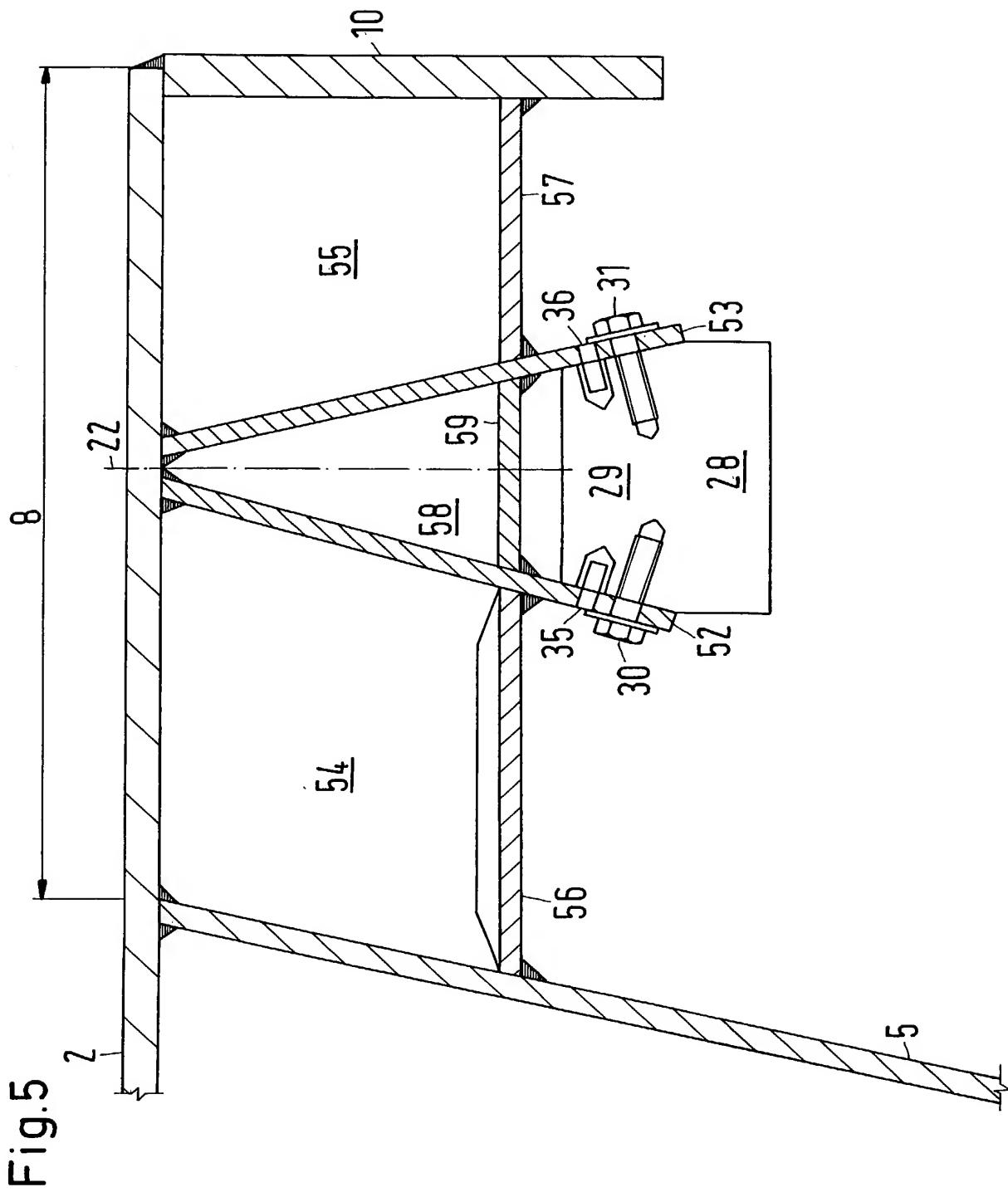


Fig.5



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**COMBINATION DECLARATION & POWER OF ATTORNEY**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name. I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

**TRACK SUPPORT**

the specification of which was filed on January 5, 2002

- as Application Serial No. 10/030,196 and

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)	Priority Claimed		
<u>199 31 367.9</u> (Number)	<u>Germany</u> (Country)	<u>07 July 1999</u> (Day/Month/Yr. Filed)	<u>X</u> yes <u>  </u> no
<u>                        </u> (Number)	<u>                        </u> (Country)	<u>                        </u> (Day/Month/Yr. Filed)	<u>  </u> yes <u>  </u> no

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)	(Filing Date)	(Status) (patented,pending,abandoned)
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(Application Serial No.)	(Filing Date)	(Status) (patented,pending,abandoned)
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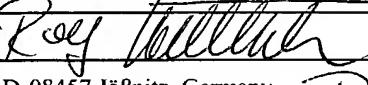
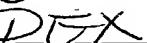
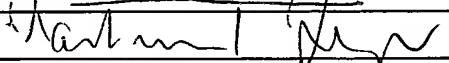
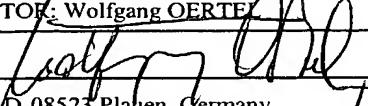
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punished by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

**POWER OF ATTORNEY:** As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:

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RESIDENCE:	CITIZENSHIP:
POST OFFICE ADDRESS:	
FULL NAME OF SIXTH INVENTOR:	
INVENTOR'S SIGNATURE:	DATE:
RESIDENCE:	CITIZENSHIP:
POST OFFICE ADDRESS:	
FULL NAME OF SEVENTH INVENTOR:	
INVENTOR'S SIGNATURE:	DATE:
RESIDENCE:	CITIZENSHIP:
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